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| 10/743,115 | 12/22/2003 | Kazunobu Maruo | 28682/38519 | 8485 |

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| EXAMINER |
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RONESI, VICKEY M

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| ART UNIT | PAPER NUMBER |
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1714

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 01/17/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/743,115

Applicant(s)

MARUO ET AL.

Examiner

Vickey Ronesi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 15-17 and 40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 18-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 2/21/06.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. In applicant's election filed on 10/17/2006, applicant elected Group I (claims 1-14 and 18-30), however, Group I as described in the restriction requirement filed on 9/27/2006 includes claims 1-14 and 18-39. Claims 1-14 and 18-39 are the elected claims.
2. Applicant's election with traverse of Group I in the reply filed on 10/17/2006 is acknowledged. The traversal is on the ground(s) that the withdrawn claims include an intercalate of the elected claims. This is not found persuasive because Group I and II are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product, and the species are patentably distinct (MPEP § 806.05(j)). In the instant case, the intermediate product is deemed to be useful as an additive in non-polymeric matrices such as waxes, greases, and lubricants and the inventions are deemed patentably distinct because there is nothing on this record to show them to be obvious variants. Furthermore, the intercalate is transformed when used in the nanocomposite because the intercalate is exfoliated.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

3. Claims 2, 24, and 39 are objected to because of the following reasons:

With respect to claim 2, the comma between "modifier" and "and" should be deleted.

With respect to claims 24 and 39, they do not end in a period. Claims must begin with a capital letter and end in a period. MPEP 608.01(m).

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Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 7, 13, 19, 21, 23, and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 7, it is not understood how the intercalant surface modifier does not include an onium ion given that the intercalant surface modifier is protonated and would provide for an onium ion.

With respect to claim 13, the term “the phyllosilicate” in line 2 of the claim lacks antecedent basis.

With respect to claim 19, the term “the phyllosilicate material” in line 3 of the claim lacks antecedent basis.

With respect to claim 20, it is not understood how the intercalant surface modifier does not include an onium ion spacing agent given that the intercalant surface modifier is protonated and would provide for an onium ion.

With respect to claim 21, there is no formula 3 recited.

With respect to claims 23 and 39, the claims appear to improperly recite a Markush group. Consequently, it is impossible to determine which elements of the group are required by the claim. When materials recited in a claim are so related as to constitute a proper Markush

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group, they may be recited in the conventional manner, or alternatively. For example, if “wherein R is a material selected from the group consisting of A, B, C and D” is a proper limitation, then “wherein R is A, B, C or D” shall also be considered proper (emphasis added). See MPEP § 2173.05(h).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-14, 18-23, 25-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Barbee et al (US 6,384,121).

Barbee et al discloses a polymer/clay nanocomposite (exfoliated) comprising a layered material with a functionalized oligomer (abstract), wherein 20-99.5 wt % of an ammonium-functionalized oligomer is present based on oligomer and clay (i.e., layered material) (col. 14, lines 26-32) and MXD6 is the preferred oligomeric polyamide (col. 8, lines 27-31). Example 24 (col. 19, lines 40-59) contains an ammonium functionalized (i.e., protonated) MXD6 oligomer. Given that the oligomer which is like that presently claimed intercalates the layered material, it is considered that it is inherent that the spacing of the layered material is at least about 5 Angstroms (i.e., a property is evidently dependent upon the nature of the composition used). Case law holds that a material and its properties are inseparable. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

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In light of the above, it is clear that Barbee et al anticipates the presently cited claims.

Claim Rejections - 35 USC § 102/103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-12 and 20-39 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lan et al (US 6,232,388, cited on IDS dated 2/21/2006).

Lan et al discloses intercalated layered materials which are intercalated with an onium ion and MXD6 nylon which is prepared from m-xylylenediamine and sebacic acid wherein the layers are expanded by preferably at least 5 angstroms (abstract). The weight ratio of MXD6 intercalant to layered material is at least 1:20 (col. 3, lines 53-57).

While Lan et al does not disclose a protonated MXD6 nylon, it is noted that claim a product-by-process claim and therefore “even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

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Alternatively, in the event any differences can be shown for the product of the product-by-process claims of instant claims, as opposed to the product taught by Lan et al, such differences would have been obvious to one of ordinary skill in the art as a routine modification of the product in the absence of a showing of unexpected results. Note that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

Claim Rejections - 35 USC § 103

7. Claims 24 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barbee et al (US 6,384,121).

The discussion set forth regarding Barbee et al in paragraph 5 above is incorporated here by reference.

While Barbee does not explicitly disclose the size of the exemplified ammonium-functionalized MXD6, note col. 9, lines 14-16 where Barbee et al teaches that the functionalized oligomeric polyamide has a molecular weight of 200-12000 which provides for the formulae presently claimed. Therefore, it would have been obvious to one of ordinary skill in the art to utilize the presently claimed oligomers given that molecular weights taught by Barbee et al.

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8. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada et al (US 4,894,411).

Okada et al discloses a polyamide nanocomposite comprising a layered silicate intercalated with an optional polyamine swelling agent that has an onium ion group (i.e., protonated group) that bonds to the layered silicate via ionic bonding (col. 3, lines 33-44; col. 4, lines 38-68). This polyamine is reacted with polyamide monomer derived from dicarboxylic acids and diamines form a polyamide polymer (col. 6, line 57 to col. 7, line 25) that is attached to the layered silicate. While Okada does not disclose oligomeric swelling agents, note that once the swelling agent is reacted with the polyamide monomer, the swelling agents becomes an oligomer which is a reaction product of at least one diamine and at least one dicarboxylic acid and the layered silicate is subsequently formed into a composite.

While Okada et al discloses both polyamide monomers derived from aminocarboxylic acids and those derived from diamines and dicarboxylic acids and exemplifies aminocarboxylic acids, it is considered that it would have been obvious to one of ordinary skill in the art to utilize such given that polyamide monomers of diamines and dicarboxylic acids (col. 7, line 35) are clearly taught.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vickey Ronesi whose telephone number is (571) 272-2701. The examiner can normally be reached on Monday - Friday, 8:30 a.m. - 5:00 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

1/5/2007

Vickey Ronesi



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